

CLAIMS

1. An arrangement for use in a light beam projection device for adjusting an orientation of a projected light beam, comprising:

a base frame;

a support platform adapted to set the orientation of the projected light beam;

a pivot member pivotally mounting said support platform relative to said base frame;

a tilting motor provided to said base frame and having a pair of output shafts influencing the orientation of said support platform, whereby rotation of said output shafts in a first direction tilts said support platform only along a first axis, and rotation of said output shafts in a second direction tilts said support platform only along a second axis; and

a power supply for driving said tilting motor.

2. The arrangement of claim 1 wherein said orientation is pitch and roll relative to gravity.

3. The arrangement of claim 1 further comprising biasing members mounted between said support platform and said base frame.

4. The arrangement of claim 1 wherein said pivot member is a gimbal arrangement.

5. The arrangement of claim 1 wherein said pivot member is mounted on said base frame.

6. The arrangement of claim 1 wherein said tilting motor is a motor selected from the group consisting of a stepping motor, a pulse motor, and a brushless DC motor.
7. The arrangement of claim 1 further comprising cams and a pair of unidirectional clutches operably connecting said output shafts to respective ones of said cams.
8. The arrangement of claim 1 further comprising cams operably connected to respective ones of said output shafts, said cams engaging an underside of said support platform, wherein said cams each have a non-circular shape over at least a portion of its exterior surface.
9. The arrangement of claim 1 further comprising a pair of cams operably connected to a respective one of said output shafts, wherein said cams engage said support platform along X and Y Cartesian axes, respectively.
10. The arrangement of claim 1 further comprising a control system controlling said tilting motor closed loop.
11. The arrangement of claim 1 further comprising a control system controlling said tilting motor open loop.
12. The arrangement of claim 1, wherein said output shafts are operably connected to respective ones of a pair of cams, said cams engaging said support platform, whereby the

rotation of said output shafts in the first direction rotates only one of said cams and rotation of said output shafts in the second direction rotates only the other one of said cams.

13. The arrangement of claim 1, wherein said output shafts are worm gears operably connected to respective ones of a pair of worm wheels.

14. An arrangement for use in a light beam projection device for adjusting an orientation of a projected light beam, comprising:

- a base frame;

- a support platform adapted to set the orientation of the projected light beam;

- a pivot member pivotally mounting said support platform relative to said base frame;

- a tilting motor provided to said base frame and having a pair of output shafts operably connected to respective ones of a pair of cams via a respective unidirectional clutch, said cams engaging said support platform, whereby rotation of said output shafts in a first direction rotates only one of said cams and rotation of said output shafts in a second direction rotates only the other one of said cams, whereby said cams adjust the orientation of said support platform, and thus the orientation on the projected light beam; and

- a power supply for driving said tilting motor.

15. The arrangement of claim 14 wherein said cams each have a non-circular shape over at least a portion of their exterior surface, said non-circular shape is selected from the group consisting of elliptical, parabolic, hyperbolic, and combinations thereof.

16. The arrangement of claim 14 wherein said orientation is pitch and roll, and said pair of cams engages said support platform along X and Y Cartesian axes, respectively, to adjust said pitch and said roll.

17. The arrangement of claim 14 further comprises biasing members mounted between said support platform and said base frame, wherein said pivot member is a gimbal arrangement.

18. The arrangement of claim 14 further comprises biasing members mounted between said support platform and said base frame, wherein said pivot member is mounted on said base frame.

19. The arrangement of claim 14 wherein said unidirectional clutch comprises a pawl and ratchet arrangement.

20. The arrangement of claim 14 further comprising a control system controlling said tilting motor closed loop via at least one sensor detecting the orientation of the support platform.

21. The arrangement of claim 14 further comprising a control system controlling said tilting motor open loop, wherein said tilting motor is a stepper motor driven by a number of impulse steps, and said control system keeps track of said number of impulse steps.

22. An arrangement for use in a light beam projection device for adjusting an orientation of a projected light beam, comprising:

a base frame;

a support platform adapted to set the orientation of the projected light beam;
a pivot member pivotally mounting said support platform relative to said base frame;

a tilting motor provided to said base frame and having a pair of output shafts operably connected to respective ones of a pair of cams via a respective unidirectional clutch, said cams engaging said support platform, whereby rotation of said output shafts in a first direction rotates only one of said cams and rotation of said output shafts in a second direction rotates only the other one of said cams, whereby said cams adjust the orientation of said support platform, and thus the orientation on the projected light beam;

a control system controlling said tilting motor;

at least one tilt sensor for providing an electrical signal representing a sensed orientation of said support platform to said control system for operating said tilting motor closed loop; and

a power supply for driving said tilting motor.

23. The arrangement of claim 22 wherein said at least one tilt sensor is first and second tilt sensors, said first tilt sensor sensing pitch of said support platform and said second tilt sensor sensing roll of said support platform.

24. The arrangement of claim 22 wherein said at least one tilt sensor is a dual axes tilt sensor sensing pitch and roll of the support platform.